PJAHS
Philippine Journal of Allied Health Sciences

Original Article

Research Productivity of Academics in Medicine and Allied Health Sciences Disciplines in Nigerian Universities: A Cross-sectional Multi-stage Cluster Study

Adetoyeje Yoonus Oyeyemi[1], Adewale Luqman Oyeyemi[1], Aliyu Lawan[1,2], Auwal Abubakar[3], Adamu Rufai[1]

[1]Department of Medical Rehabilitation, Faculty of Allied Health Sciences, College of Medical Sciences, University of Maiduguri;
[2]Faculty of Health and Rehabilitation Sciences, and Western's Bone and Joint Institute, Western University, London, Canada;
[3]Department of Medical Radiography, Faculty of Allied Health Sciences, College of Medical Sciences, University of Maiduguri

Correspondence should be addressed to: Aliyu Lawan[1,2]; aliyulawan@unimaid.edu.ng

Article Received: May 30, 2022

Article Accepted: July 27, 2022

Article Published: August 15, 2022

Abstract

Background: Research is the act of inquiry to know and is one of the pivotal points and fundamental goals of a university. It is an important part of an academic job and is believed to be the next most valued part of their duty after teaching. **Objectives:** This study aims to determine the research productivity of Nigerian academics in medicine and allied health sciences disciplines in Nigeria. **Methodology:** 177 participants completed a 41-items questionnaire that elicits information on sociodemographic, the institution, the program, and research productivity (research papers, conferences attendance and presentation, and book chapters) using a multistage cluster random sampling of Nigerian Universities. **Results:** Majority of the included participants were male (70.06%), married (79.14%), and below the senior teaching cadre (38.99%). Majority of the academicians do not have any training overseas (67.06%) and have indicated time as a constraint to research productivity (67.06%). Three papers in the past two years is an indication that Nigerian academics in the medical and allied health sciences, on average, may not be deemed to be highly productive. Professors (16.58+27.14) and those in higher ranks (Readers: 11.84+11.22 and senior lectures 12.58+13.53) have published more papers than their counterparts in the junior cadre (lecturer I and II: 4.87+6.58 and 2.69+3.87). Academics in the present study has a median research grant of zero in the past two years. A simple majority of the participants (55.29%) agree on mandating of PhD for promotion and career advancement of academics. There is no difference in the number of papers published (6.04+10.52 and 7.62+13.21) or conferences attended (7.42+19.14 and 4.04 +4.02) between academics in private and public Universities. **Conclusion:** Apparently low and dismal productivity by these academics in medicine and allied health sciences affirm the need for capacity building on an ongoing basis.

Key Words*: research output, publications, scholastic productivity, Africa*

INTRODUCTION

Research is the act of inquiry to know and is one of the pivotal points and fundamental goals of a university.[1] It is an important part of an academic job and is believed to be the next most valued part of the duty of academics after teaching. Engaging in research attracts prestige and favorable scholastic rating among academics and contributes positively to the ranking of their institutions. Traditionally, individual academic research productivity is precisely measured by the number of peer review journal articles published, national and international conference presentations, and research grants obtained over a period of time, usually 2-3 years period. From over a decade ago, research productivity has been quantified by H-index, by how a scholar ranks in Google scholar, hc index, g-index, i-10 index, and how an academic rate on Scopus rating.[1]

Nigeria is a developing west African country with a population of approximately 200 million, according to the National population commission 2020 reports. Nigeria is the most populous country in the world, with a gross domestic product of 510.59 billion US dollars. Nigerian

Universities are divided into Federal, State, and Private owned. The division determines its funding and institutional leadership and support. Academics are employees of the university whose duties include teaching, research, service, and administration through committees. Nigerian Universities have seen several trends in their research output. The National University Commission (NUC) noted that Nigerian tertiary institutions were ranked best in quality and quantity of research output until 1980s[2] and by 1996, their research output became all-time low.[3] In fact, a report by NUC shows that no Nigerian university was listed among the best 1000 world universities in terms of scholastic productivity in the year 2000[4] and the best Nigerian University, according to the Centre for World University Ranking, was ranked 1172 with an overall score of 69.3 points in the year 2022.[5] Thus, Nigerian Academic Staff Union of Universities (ASUU) have engaged on a routine trade dispute with the government owing to long-standing poor funding and infrastructures in the education sector, which was seen as a major factor to the poor performance by the universities according to ASUU.

In this study, research productivity is defined according to the number of research papers published, conferences attended, papers presented in a scientific conference, and chapters of a book published. Research productivity plays a major role in the career advancement of academics as it is often used to determine the eligibility for promotion, tenure as well as salary placement.[6] It has been argued that countries with low research productivity could remain underdeveloped[7] and universities in such countries would always rank low compared to those in the developed countries due to low capacity to conduct research.[8] Consequently, interest has been sparked in research productivity, and several previous studies exist on research productivity of academics in the medical and health sciences discipline.[9–12] Factors determining academic productivity have been grouped into either individual faculty and institutional and leadership factors.

Some individual factors have been identified as having the highest terminal degree within a field, early publication habit, previous publication activity, communication with colleagues, subscription to a large number of journals, and sufficient time allocated to research.[13] Institutional factors have also been identified to include leadership attitude and support for scholarship, orientation about research upon employment, and institutional mission and philosophy.[12,14–16] Major challenges or hindrances to productivity have also been identified to include onerous working conditions, balance in the drive to advance equity and realize academic excellence, and the poor quality of senior managers in the knowledge system.[17]

Academics in medical and allied health disciplines engage in clinical care, in addition to teaching, research, and performing committee work.[10] In the past, concerns have been expressed in some quarters that academics in these disciplines most often focused on patient care and teaching, devoting little time to research activities[9] and may therefore have scanty publications. This is, however, in contrast with anecdotal report that shows Nigerian academic in health sciences disciplines have increased their research productivity, although this has not had a positive impact on society.[7] Meanwhile, there is no empirical and firm data on the current status of Nigerian academics on research productivity exist. The objective of this study is to determine the research productivity of Nigerian academics in medicine and allied health disciplines in Nigeria. Understanding academic productivity and leadership and institutional supporting factors in the medical and allied health disciplines in Nigeria Universities will provide the foundation to reinforce promoting scholastic and research productivity among the cohort.

METHODS

Ethical Considerations. The study was approved by the research and ethics committee of University of Maiduguri Teaching Hospital (UMTH/REC/17/00102).

Study Design, Settings, and Participants. As of 2016, 31 Universities houses colleges/faculty of Medical Sciences. Five are private universities, nine state government-owned universities, and 17 are federal universities.[5] Altogether, by geopolitical zones, seven of the universities were

in the South-West, nine in the South-South, seven in the South-East, three in the North-West, four in the North-Central, and two in the North-East of Nigeria. A multi-stage random sampling of full-time lecturers from colleges and faculties of Health or Medical sciences from federal, state, and private universities across the country was included in this cross-sectional survey. In stage one, the list of Nigerian Universities that houses colleges or faculties of health sciences or medicine was obtained from the Joint Admission and Matriculation Board (Brochure), and the relevant universities were identified and stratified by ownership (federal, state, and private universities) and six geopolitical locations (Northeast, Northwest, Northcentral, Southwest, Southeast, Southsouth).

In stage two, one federal university from each of the six geopolitical regions of Nigeria was randomly selected. The federal University in the northeast zone was automatically selected as it is the only eligible university in that region. Only three regions have eligible private universities, and two universities were selected from the two main regions (the North and South). Similarly, from the eligible state-owned universities, two were selected from the North and South regions. A total of 10 universities were selected for participation. In the final stage, a rank-ordered listing of lecturers from Professor to Graduate Assistants or assistant lecturers in each department and programs in the colleges and faculties in the selected universities were obtained. Based on a total estimated population of 1500 lecturers at a 95% Confidence Interval, a minimum sample of 429 was needed (www.macorr.com/sample-size-calculator.htm; accessed February 13, 2013). To ensure a fair representation, every third lecturer on this list was surveyed.

Instrumentation. The questionnaire (Supplementary A) was developed from an extensive review of literature on research productivity across various disciplines, focusing on accessing academic research productivity among lecturers in Nigerian Universities. The authors reviewed the content and structure of the questionnaire, and the questionnaire was pilot tested among 10 lecturers, each with 5 - 10 years of teaching and scholastic publication experience, to access its clarity, ease of completion, and reliability, and all attested to the face and content validity of the instrument. The final instrument comprises five sections with a total of 41 items that include both open and close-ended questions; Section I of the questionnaire elicits information on the demographic data of the lecturers such as age, gender, marital status, religion, years of experience, rank, highest academic qualification, faculty and department.

In section II, information about their institution was elicited. Section III consists of items that review and evaluate the program in which they teach. In section IV, profile of lecturers in the department was accessed. Data on the scholastic record of the lecturers were obtained in section V, which was based on a preceding two years record as proposed by Levin and Stephan[18] as the time when publications were used to measure lecturers each with 5-10 years of teaching and publication experience also completed the final instruments two times within a one-week interval. The reliability coefficient between 0.76 and 0.84 was found for all sections of the questionnaire.

Procedure. Provosts of Colleges and Deans of relevant faculties were first contacted, and their permission was sought to survey the lecturers using a letter addressed to these academic administrators. Upon authorization, each department and programs were approached, and questionnaires were delivered to the Head of Departments for distribution to the eligible identified lecturers who were systematically selected from a ranked ordered listing obtained from the departments.

At each University, a package containing the questionnaire along with an introduction and consent letters were placed in the mailboxes of the randomly selected lecturers. The packages also contain a return envelope, and participants were requested to return the completed questionnaires to their departmental secretaries for collection by the research assistant at each center. The study started in February 2018 and ended in November 2018. In-between the study period, reminders were sent to the selected participants every four weeks. The study was terminated when no additional questionnaire was received after the four reminders.

Statistical Analysis. Data was imported into IBM Statistical Packages for Social Sciences (SPSS), version 22 (IBM Corporation, Armonk, NY, USA) for statistical analysis. All entered data were checked for missing values and outliers using count and boxplot. Descriptive statistics of mean, standard deviation, frequencies, and percentages were used to summarize the data. Data were checked for normality and other statistical assumption relative to the type of analysis. Differences in indices of research productivity between academics in medicine and allied health disciplines and by sociodemographic characteristics were explored using independent t-test and One Way-Analysis of Variance for the means of two and three group data as appropriate. All statistical significance was set at $p<0.05$.

RESULTS

Overall, completed questionnaires from the three federal universities, one state university, and one private university were received and analyzed.

Participants' Sociodemographic Characteristics. Out of the 468 questionnaires distributed, only 177 were returned usable, giving an effective response rate of 37.82%. The mean age of respondents is 43.73 years (*SD*=9.87; *Median*= 44), and their mean duration of working experience is 8.73 years (*SD*=8.62, *Median*= 6). Majority of the participants (70.06%) were male and married (79.14%). While 33 were in the professorial rank (i.e., professors and readers 18.65%), only 31(17.71%) of the respondents reported that they have a terminal doctorate degree of PhD or equivalent as their highest degree (Table 1).

Institutional Support and Academic Characteristics. The mean hours spent on research work per week is 1.53+1.74 (*Median*= 1), and the mean number of papers published in the past two years by the respondents is 7.62+13.01 (*Median*= 3). In the past two years, the mean number of conference papers presented is 2.64+5.37 (*Median*= 2), while the number of conferences attended is 4.04+8.38 (*Median* = 3). The number of book chapters published in the past two years is 0.68+1.71 (*Median* =0), while the number of research grants obtained is 0.22+0.79 (*Median* = 0).

Table 1. Participants' socio-demographic characteristics

Variable	Number	Percent
Gender		
Male	124	70.06%
Female	53	29.94%
Rank		
Prof	20	11.30%
Reader	13	7.35%
Senior Lecturer	36	20.34%
Lecturer 1	44	24.86%
Lecturer 11	42	23.73%
Others	22	12.43%
Highest Qualification		
Bachelor	12	6.68%
MSc	64	36.57%
Post Graduate Medical Qualification	68	38.86%
PhD	31	17.71%

About half of the respondents (*n*= 88; 53.99%) reported that their institution induced them to pursue a higher degree. Most academics (*n*= 94; 55.29%) reported that they support mandating PhD as a requirement for promotion to higher ranks. The overwhelming majority of the academics (*n* =146; 85.38%) supported mandating student evaluation of their lecturers, and similar proportion (*n*= 144; 83.24%) supported peer evaluation as a regular assessment practice for academics. Many lecturers (*n*= 126; 73.26%) hold no administrative responsibilities, and the overwhelming majority (*n*= 154; 90.59%) consider working in their present department again. More than half of the lecturers (*n*= 100; 58.82%) believe their teaching load is conducive to carrying out research and 92.94% (*n*= 158) reported that they are aware of the expectation of scholastic activity requirement for a promotion. Details of institutional support and academic activities are reported in Table 2.

Table 2. Institutional Support and Academic Activities

Institutional Supports			Academic Activities		
Variables	**Yes**	**No**	**Variables**	**Yes**	**No**
Are lecturers induced to pursue higher qualification?	88(53.99%)	75(46.01%)	Is teaching load conducive in carrying out research?	100(58.82%)	70(41.18%)
Mandating PhD	94(55.29%)	76(44.71%)	Expectations of scholastic activities for promotion	158(92.94%)	12(7.06%)
Student supports student evaluating themselves	82(48.81%)	86(51.19%)	Are departments in collaboration with similar entity in other	95(61.29%)	60(38.71)
Lecturer's support of student evaluating them	146(85.38%)	25(14.62%)	Training Overseas	56(32.94%)	114(67.06%)
Support peers evaluation	144(83.24%)	29(16.76%)	Are time constraints a factor for carrying out research?	131(75.29%)	43(24.71%)
Lecturers holding administrative responsibilities	46(26.74%)	126(73.26%)			
Consider again	154(90.59%)	16(9.41%)			

Note: Data is presented as n, (%)

Indicators of Research Productivity by Socio-demographic. Table 3 shows the indicators of research productivity by sociodemographic and type of institution. The mean number of papers published by professors is 16.58 (*SD*=27.14) and is higher than the number of papers published by respondents of the other ranks in absolute terms. The number of papers published by respondents who hold the rank of reader and senior lecturers was 11.84+11.22 and 12.58+13.53, respectively. In absolute terms, Professors have published more articles than Readers, but the difference is not statistically significant (*Mean*=16.58, *SD*= 27.14 vs. *Mean*=11.84, *SD*=11.22, $p<0.05$). No significant differences were observed in productivity by gender ($p>0.05$) among the participants. There is no significant difference in the number of papers published between the academics with MSc and Postgraduate medical qualifications (*Mean*= 6.27, *SD*= 12.43 vs. *Mean*= 7.56, *SD*= 12.87). and between the number of papers published by postgraduate medical qualification and PhD holders (*Mean*= 7.56, *SD*= 12.87 vs. *Mean*= 12.26, *SD*= 15.24).

The mean number of conferences attended by Professors in the past three years is 5.92+6.37, while the mean number of conferences attended by senior lecturers is 4.42+5.04. Those with PhD have attended an average of 4.86+5.04 conferences in the past two years, while those with postgraduate medical qualifications and those with master's degrees have attended 5.89+12.04 and 3.14+3.63 conferences in two years, respectively. By rank, the number of conferences attended by Professors is higher than that of lecturer II (Mean= 5.92, SD= 6.37 vs. Mean= 2.82, SD= 2.68, $p<0.05$), and Readers have attended more conferences ($p<0.05$) than those in the rank of Lecturer II (*Mean*= 4.42, *SD*= 2. vs. *Mean*= 2.82, *SD*= 2.68). No significant difference in conference attendance was observed by gender or by institution (public or private and between federal and State institutions). Those with PhD have presented 6.25+10.76 papers in the past two years. Professors have presented in 7.44+13.42 conference papers, while lecturer I and senior lecturers have presented 1.74+2.14 and 3.13+3.66 conference papers, respectively. Professors significantly presented more conference papers ($p<0.05$) than lecturer I (*Mean*= 7.44, *SD*= 13.42 vs. *Mean*= 1.74, *SD*= 2.14, $p<0.05$). There is no statistically significant difference in the number of books published by gender and by type of institution (private vs. public) or between Federal and State institutions.

Table 3. Research Productivity by sociodemographic and type of institution

Variables	Paper published	Conferences	Conference paper	Book published
Gender				
Male	7.73±13.68	4.89±9.44	2.29±3.24	0.74±1.33
Female	6.48±10.81	4.54±9.37	3.29±8.44	0.94±2.41
Rank				
Prof	16.58±27.14[a]	`5.92±6.37[a]	7.44±13.42[a]	1.89±1.91[a]
Reader	11.84±11.22[b]	4.42±2.41[b]	3.71±3.46[b]	0.93±1.14[b]
Senior Lecturer	12.58±13.53[c]	4.42±5.04[c]	3.13±3.66[c]	0.44±0.78[ca]
Lecturer I	4.87±6.58[dbc]	6.08±14.72[d]	1.74±2.14[dab]	1.03±2.18[da]
Lecturer II	2.69±3.73[ebcd]	2.82±2.68[eabd]	1.12±1.48[eabc]	0.10±0.73[eabcd]
Others	2.12±2.87[fabcd]	3.41±2.34[f]	1.19±1.48[fabc]	0.78±2.31[fa]
Highest education				
Bachelor	0.20±0.39[a]	3.41±3.32[a]	0.07±0.63[a]	0.01±0.01[a]
MSc	6.27±12.43[ba]	3.14±3.63[b]	1.63±2.84[ba]	0.42±1.01[b]
Post Graduate Medical Qualification	7.56±12.87[ca]	5.89±12.04[cb]	2.34±2.48[cab]	1.04±1.75[cab]
PhD	12.26±15.24[dab]	4.86±5.04[db]	6.25±10.76[dabc]	1.24±2.54[dab]
Institution				
Private	6.04±10.52	7.42±19.14	1.55±2.57[a]	0.68±1.22
Public	7.62±13.21	4.04 ±4.02	2.79±5.68[ba]	0.73±1.84

Note: Data is presented as Mean ± SD; The superscript letter denotes where there is a statistically significant difference in the group. The differences were only reported when the statistical test was significant. Two superscripts denote differences between two variables.

DISCUSSION

Boyer[19] has espoused an expanded view of scholarship, surmising that academics are expected to show excellence in the area of inquiry, pedagogy, service, and integration. Nonetheless, scholarship in inquiry or research remains the main yardstick for measuring academic productivity, especially in the health sciences discipline. Therefore, academics in the health sciences are expected to be productive in research by conducting research studies and publishing them in journals. In many quarters, an academic may be deemed productive if two papers are published in every year or four in two given years. At an average article of seven publications in two years, the productivity of Nigerian academics in the present study may look good, but this is not quite the case due to the skewed nature of the data and the variance as indicated by the standard deviation, the average figures as depicted above can be misleading.

At the research productivity level set at two papers per year, a median of three in the past two years, it can be argued that most academics in this study may not be deemed to be highly productive on average. Low productivity based on the median score is quite dismal. The low productivity level found in this study agrees with a study that shows low research productivity among academics in health sciences in West Africa, including Nigeria.[20] It is also in sync with a report that shows African scientists have a comparatively low index than their counterparts in other parts of the World, as depicted by an index of productivity, the H-index[21,22] although the improvement was reported anecdotally.[22] The dismal productivity rate is further corroborated by the results that show academics in the present study reported a median research grant of zero, indicating that virtually all the academics, including those in the senior ranks, have not received any grant in the past two years.

The foregoing suggests that this cohort of academics is not active in grantsmanship or at least in the outcome of grant applications. Elsewhere, grantsmanship is key to promotions and tenure in today's world; writing grants are key skills that academics must possess to stay competitive globally. Therefore, capacity building on grant writing may be warranted for this group of academics. Conferences organized by professional associations and learned societies are avenues for collegial interactions and are veritable venues for disseminating research findings. Our results that show a

median of three conferences attended and one conference presentation by this cohort of academics in health sciences indirectly affirms the lack luster productivity of academics in research. Similarly, a median book published of zero proves the reality of continuous and heavy reliance on textbooks authored by foreign scholars among health sciences training programs in Nigerian Universities.

This study found no differences in productivity between male and female academics, similar to the findings[12] among researchers (*n*= 77) in the faculty of science in two Nigerian universities. The present findings, however, are contrary to the previous report that show male African Academy fellows in the medical and health sciences are more productive in research with high H-index than their female counterparts.[23] Professors have published more papers than Readers and Senior Lecturers. However, Readers have not published more than Senior lecturers, even though the mean number of publications recorded by the Senior Lecturers is more than that of the Readers in absolute terms. A previous study supports findings that Professors have published more papers.[12] Nonetheless, caution should be used to interpret this study's subgroup differences observed in research productivity, conference attendance, and presentation. This is because of the wide dispersion around the means, making these differences unarguably tenuous.

Furthermore, the differences observed by subgroups seem to be slightly consistent in productivity. For illustration, Professors in the present study were more productive than Readers. Though senior lecturers tend to be more productive than readers, there is wider distribution in productivity of senior lecturers compared to readers. It is possible, however, that with larger sample size and considerations of time in rank, differences may be more apparent by subgroups. Upon further analysis with dichotomized data, we found that the number of publications reported by the lecturers in the senior ranks (Professors, Readers, and Senior Lecturers combined as a group) is significantly more than those of the junior lectures (Lecturer I, Lecturer II, Assistant Lecturers, and Graduate Assistants). Similar trends were observed for conference presentations and conference attendance but not for book or book chapter publications. Therefore, scholarly productivity improves as academics advance from the junior cadre to the senior level.

A majority of this cohort of academics reported they are induced to pursue higher qualification, indicating that many did not report they were induced. Furthermore, although a majority of the academics in the present study support mandating PhD for advancement of academics in universities, many academics do not support mandating it. It is plausible that responses on inducement to pursue higher qualifications and these many academics responding negatively on mandating PhD is a reflection of the composition of the cohorts. Academics in allied health disciplines have PhD (60.50%), while those in medicine and dentistry (38.40%) have postgraduate professional certification as their terminal qualifications. This result suggests a partisan divide between those in the disciplines of medicine and dentistry on the one hand and others in the basic medical and allied health disciplines on mandating PhD for career advancement as recently proposed by the National Universities Commission, an agency with oversight functions over Universities in Nigeria. Presently in the Colleges of Health/Medical Sciences in Nigerian Universities, certain positions such as the provost are somewhat willed or reserved for educators described as 'medically qualified.' In practice, therefore, only academics with medical degrees can attain the administrative headship of a College.[23] Through the responses to the questionnaire survey, it can be argued that this study also provides insights into the barriers and challenges encountered in survey research among Nigeria Universities, for which further study is warranted for elucidation. Finally, the need for capacity building on an ongoing basis in medicine and allied health sciences requires the attention of administrators and policymakers.

One limitation of this study is the low response rate (*n*= 177, 37.84%). This was because no response was received from one public and one private university. Thus, this study's findings may not generalize academics in Nigeria. Similarly, our study encountered other setbacks because of the 2016/2017 Academic Staff Union of Universities (ASUU) strike, which began after

the study package was distributed. Also, in one public and one state university, there was limited support from the administration to survey the academic staff of the college because of the order of arrangement of the highest qualification was erroneously interpreted as placing PhD above the professional specialization certification in medicine and dentistry. Similarly, because the study is time-bound, no questionnaire was sent to other universities that did not return their response after consecutive reminders. Also, the authors believe the logistic problems encountered during this survey were not a good experience. Therefore, the strength of this study lies not solely in being the first multi-center study on the research productivity of academics in health sciences in this country but also on some aspects of academic leadership and research disposition in Nigerian Universities.

CONCLUSION

Although the sample may not adequately represent the Nigerian universities' academic population, the study provides firm empirical data on Nigerian academics' research productivity and highlights the need for capacity building in Nigerian Universities housing faculties of Allied Health Sciences.

Acknowledgment

The authors would like to thank Mr. Tolu for assisting with compiling incoming questions at the main research center, the study research assistants for their support, and the academics for participating in the survey.

Individual Author's Contributions

All authors substantially contributed to this study and its publication.

Disclosure Statement

This work was supported by a grant from the Tertiary Education Trust Fund (TetFund) 2017: TETFUND/DESS/UNIMAID/MAIDUGURI/RP/VOL.II.

Data Availability: The data supporting this study's findings are available from the corresponding author, [AL], upon reasonable request.

Conflicts of interest

There are no conflicts of interest declared by the authors of this study.

Supplementary Material

Supplement A. Lecturer's Assessment Survey

References

1. Choudhri AF, Siddiqui A, Khan NR, Cohen HL. Understanding bibliometric parameters and analysis. Radiographics. 2015;35(3):736-46. DOI: 10.1148/rg.2015140036
2. Karani FA. Higher education in Africa in the 21st century in In African Regional Consultation Preparatory to the World Conference on Higher Education, Dakar, Senegal 1997.
3. Okebukola P, Solowu O. Survey of university education in Nigeria. Journal of Curriculum Studies. 2001;223.
4. Chiemeke S, Longe OB, Longe FA, Shaib IO. Research outputs from Nigerian tertiary institutions: an empirical appraisal. Library Philosophy and Practice. 2009:1.
5. Akintade A. World university ranking places UI 1,172 globally; number one in Nigeria. Peoples gazette; 2022.
6. Balogun JA, Sloan PE. Emerging trends on tenure policies and practices in nursing and allied health education. Journal of Allied Health. 2006;35(3):134-41.
7. Odeyemi OA, Odeyemi OA, Bamidele FA, Adebisi OA. Increased research productivity in Nigeria: more to be done. Future Science Osteoarthritis. 2019;5(2). DOI 10.4155/fsoa-2018-0083
8. Michael, N. No Title. America's Top Colleges (Methodology); 2011.
9. Brocato JJ, Mavis B. The research productivity of faculty in family medicine departments at U.S. medical schools: a national study. Academic Medicine. 2005;80(3):244-52.
10. Mezrich R, Nagy PG. The academic RVU: a system for measuring academic productivity. Journal of American College of Radiology. 2007;4(7):471–478. DOI: 10.1016/j.jacr.2007.02.009
11. Frantz JM, Rhoda A, Struthers P, Phillips J. Research productivity of academics in a physiotherapy department: a case study. African Journal of Health Professional Education. 2010;2(2):17–20. DOI: 10.10520/AJA20785127_5

12. Obembe OB. Determinants of scientific productivity among Nigerian University academics. Indian Journal of Science and Technology. 2012;5(2):2155–2164.
13. Sulo T, Kendagor R, Kosgei D, Tuitoeks D, Chelanat S. Factors affecting research productivity in public universities of Kenya: the case of Moi University, Eldoret. Journal of Emergent Trend in Economics Management Science. 2012;3(5):475-84. DOI: 10.10520/EJC127672
14. Itagaki MW, Pile-Spellman J. Factors associated with academic radiology research productivity. Radiology. 2005;237(3):774–780. DOI: 10.1148/radiol.2373041508
15. Usang, B., Basil, A., Lucy, U. & U, U. F. Academic Staff Research Productivity: A Study of Universities in South-South Zone of Nigeria. Education Research Review. 2007;2(5):103–108.
16. Ogbogu CO. An analysis of female research productivity in Nigerian universities. Journal of Higher Education Policy and Management. 2009;31(1):17–22. DOI: 10.1080/13600800802558841
17. Habib A, Morrow S. Research, research productivity and the State in South Africa. Journal of Higher Education in Africa. 2007;5(1):113–130.
18. Levin SG, Stephan PE. Age and Research Productivity of Academic Scientists. Research in Higher Education. 1989;30(5):531–549. DOI: 10.1007/BF00992202
19. Boyer EB. Scholarship Reconsidered: priorities of the professoriate. The Carnegie Foundation for the Advancement of Teaching. Princeton University Press; 1990.
20. Sam-Agudu NA. et al. Building Sustainable Local Capacity for Global Health Research in West Africa. Annals of Global Health. 2016;82(6):1010–1025. DOI: 10.1016/j.aogh.2016.10.011
21. Balogun JA. Advocacy for Research Evidence in Academic Public Policy Development. African Journal of Reproductive Health. 2019;23(3):9–18. DOI: 10.29063/ajrh2019/v23i3.1
22. Balogun J, Mamuzo E, Okonofua F, Balogun A, Oyeyemi A. Bibliometric profile of the African academy of sciences medical and health sciences fellows. The Pan African Medical Journal. 2021;38:1–11. DOI: 10.11604/pamj.2021.38.60.21004